MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

Organized 1890.

[This Association as a body is not responsible for statements or opinions of any of its members.]

VOL. IV. APRIL, 1894. NO. 2.

QUARTERLY MEETING.

THE Massachusetts Association of Boards of Health held its regular meeting at the Parker House, Boston, on the afternoon of Thursday, April 26, 1894. The meeting was called to order by the President, Dr. Henry P. Walcott, who stated that the reading of the records of the last meeting would have to be dispensed with, owing to the absence of the Secretary.

On motion of Dr. S. H. Durgin, Dr. Farnham, of Cambridge, was appointed Secretary *pro tem.*

The PRESIDENT. The Executive Committee have to report to you the following names for membershlp in the Association: Dr. W. P. Bowers, of Clinton; Dr. J. A. Douglass, Dr. J. A. Fitz-Hugh and Mr. H. Cooper, of Amesbury; Dr. E. L. Warren, of Melrose; Mr. Edmund M. Parker and Charles Harris, of Cambridge.

The above named gentlemen were elected members of the Association.

The PRESIDENT. The Committee also recommend to the Association for action at this time, the following resolution:

"*Whereas*, an amendment is now before the General Court of Massachusetts exempting all children from vaccination upon presentation of a certificate of any reputable physician that they are not in condition to submit to it, therefore —

"*Be it resolved*, that the Massachusetts Association of Boards of Health considers that this amendment will largely nullify the objects of the bill, and will obstruct the efforts of boards of health in enforcing vaccination, and that it believes the amendment should not pass."

In explanation of that, it should be said, as many of you probably know, that an amendment to the vaccination law has been introduced, by which any person can present in behalf of a child, a statement from any physician

whatever, stating that this child is not a proper subject for vaccination, and under that certificate the child at once enters the school, notwithstanding the present law that makes vaccination necessary. The Executive Committee feel that the influence of this Association should be thrown into the scale, if possible, to prevent this, and they therefore recommend this Association to adopt the resolution which I have read to you. Is there anything to be said about it?

Dr. DURGIN. This resolution is offered, I presume, for the reason that this subject is being discussed in the State Senate, and may be acted upon this afternoon, having been acted upon favorably in the House, and if the resolution meets the views of the Association, that expression ought to reach the Senate this afternoon. It seems to me that as a representative body we ought to speak upon this question, and it seems to me also that the Legislature would be glad to hear from this body upon this important subject, for the amendment undoubtedly breaks the whole force of the present excellent law on vaccination. I therefore move that this resolution be adopted.

The motion was seconded, and the resolution was adopted.

Dr. DURGIN. I would also move that a copy of this resolution be sent immediately to the chairman of the Committee on Public Health on the part of the Senate.

The motion was seconded and adopted.

The PRESIDENT. Is there any committee to report at this time? If not, the Association will proceed with its regular business for the afternoon, which is, first, a general discussion of the recent prevalence of smallpox in Massachusetts and the lessons taught by it. I will call upon Dr. McCollom to say something concerning the recent epidemic in Boston.

Dr. J. H. MCCOLLOM. Mr. Chairman and Gentlemen: Smallpox in Boston has been a rare disease until within the last six or eight months. Perhaps it will be well at this time to look back to the earlier history of Boston previous to the discovery of vaccination. Previous to 1789 there were five distinct epidemics of smallpox in this city. These epidemics were so severe that in each of them nearly one-third of the inhabitants succumbed to the disease. It was during one of the later of these epidemics that inoculation came into use. In order to ensure the full benefits of inoculation, a hospital was established at Noddle's Island, one at Point Shirley, and one at Brookline, to which the people of Boston were allowed access. Inoculation diminished the number of deaths from smallpox, but it also served to keep alive the disease. It is interesting to notice that out of 5,075 inoculations at Point Shirley, there were only five deaths, showing that inoculation did diminish the severity of the disease.

In 1800, vaccination, the discovery of Jenner, came into use. I have here a paper published by the Board of Health of Boston in 1801, proving the protective power of vaccination, and in these days when so much is heard from the anti-vaccinationists that vaccination does not protect from smallpox, it is extremely interesting to notice that nineteen children were vaccinated in the first place, and passed through the disease of cow-pox in the natural way. Shortly after they were vaccinated, these nineteen children, together with two unvaccinated children, were inoculated with smallpox. The nineteen vaccinated children were exposed to smallpox for four or five weeks, and did not contract the disease, whereas the two who had not been vaccinated contracted it. The report of the Board of Health is as follows:

"REPORT OF THE BOARD OF HEALTH.

"The Board of Health for the town of *Boston*, are happy to have it in their power this day, to announce to their fellow-citizens the result of one of the most complete experiments which perhaps has ever been made, to prove the efficacy of the Cow-Pox, as a preventive against the Small-Pox; and while they take the liberty to congratulate the public on this important discovery, they do earnestly recommend its introduction generally, and are confident that it will be the means of preserving the lives and adding to the happiness of millions.

"The utmost care has been taken, during the experiments; and a detailed statement of facts are subjoined, for the gratification of every enquirer.

"In June, 1801, Dr. Jackson addressed a letter to the Board of Health, requesting their countenance in certain experiments which he contemplated making, to prove the efficacy of the Cow-Pox, as a preventive against the Small-Pox; to which application the avocations of the Board would not permit that attention which the plan proposed by Dr. Jackson required.

"In June, 1802, Dr. Waterhouse made a similar application, accompanied with a very minute history of that disorder, from himself, and also various documents in proof of its utility, from Societies in *New York* and elsewhere, who had associated for the purpose of making experiments similar to those proposed to be made by Dr. W., by which it appeared, that the public in those places, were deriving incalculable benefits by a pretty general inoculation. About this time the Small-Pox was raging in the family of Mr. Holden, *Fifth Street*, and three persons out of five, under the care of the Board of Health, had died. The Cow-pox had obtained much credit.

"The Board of Health, deeply affected with the fatal ravages of the Small-Pox, in the family before mentioned, and viewing their Institution as founded, under God, for the preservation of the health of their fellow-citizens; and believing, as they did, that this mild and safe disorder, "*the*

Cow-Pox," might be substituted for that fatal and distressing one, the Small-pox; so that if generally adopted, completely to annihilate and blot it from the catalogue of human woes; determined, under the influence of these considerations, to prove by experiments, to be made under their immediate observation, whether their faith in the efficacy of the Cow-pox was well founded or not.

"With this view, the plan of the experiments proposed were published in the newspapers, for the consideration of their fellow-citizens. The Secretary of the Board was also directed, in their name, to desire the assistance of Doctors Lloyd, Danforth, Rand, Jeffries, Warren, Jarvis and Waterhouse, who, agreeably to the invitation of the Board, met them at the Health-Office. Various impediments presented themselves in carrying into effect the plan as published. It was alleged, that the distance of *Rainsford's Island* from town, would prevent attendance of the gentlmen concerned, as often as would be requisite; and to make them in town, it would be necessary to have the permission of the town, in town-meeting, it being contrary to law to inoculate with the Small-pox without it. It was therefore determined to apply for this privilege; and the town being assembled for that purpose, it was objected to, on the grounds that it would alarm the country, and injure the trade of the town. After much debate, it was voted by the town — 'That the Board have power to make the experiments proposed, without the limits of the town; and to take up suitable buildings, etc. for that purpose.' It was with much difficulty a place could be obtained, comporting with the vote of the town. But started in the pursuit, the object, the happiness of mankind, the Board was determined that no difficulties which perseverance could surmount, should divert them from their purpose.

"At length Mr. Williams gave permission to erect a small building on *Noddle's Island*, and to make the proposed experiments there. Thus provided, on the 16th day of August, nineteen children, viz.:

DANIEL SCOTT, Chambers-Street.
ALMARIN CLARKE, Cornhill.
JOHN SILSBY, Prince-Street.
OZIAS GOODWIN, Charter-Street.
GEORGE GOODWIN, Charter-Street.
SAMUEL WATTS, Charter-Street.
SAMUEL RICHIE, Charter-Street.
ROBERT WILLIAMS, Cole Lane.
HENRY WILLIAMS, Cole Lane.
REUBEN LORING, Willson's Lane.
THOMAS TRUMAN, Dogget's Alley.
E. L. TRUMAN, Dogget's Alley.
JOHN WYER, Dogget's Alley.
SETH KING, Dogget's Alley.
GEORGE FORBES, Market-Square.
WILLIAM AUSTIN, Market-Square.
JOHN HARRIS, Fifth-Street.
THOMAS SPEAR, Friends-Street.
WM. GREENE, Hanover-Street.

Were inoculated with the Cow-pox, at the Health-Office, in presence of the Board, and of a number of gentlemen invited. The physicians who attend-

ed were Drs. *Lloyd, Rand, Jeffries, Warren, Waterhouse, Wells, J. C. Howard,* and *T. Danforth;* and the children went through the disorder to the satisfaction of the gentlemen, physicians and of this Board.

"Fresh Small-pox matter being obtained, through the politeness of Dr. Weeks, the proprietor of the Small-pox hospital at *Falmouth* — on the ninth of November, twelve of the children before named, together with *George Bartlett,* son of Dr. *Bartlett,* of *Charlestown,* who had the Cow-pox two years since, were inoculated at the hospital erected on *Noddle's Island,* with the Small-pox, from the matter obtained from Dr. *Weeks* — and at the same time two children of Mr. *Christopher Clark* of *Hinchman's Lane,* viz. *Thomas* and *John,* who had never had either the Cow-pox or Small-pox, were also inoculated with the latter; and in the proper time the arms (of the two *Clarks*) become inflamed — the symptomatic fever, and usual appearances attending the Small-pox, appeared — and finally pustules to the amount of about 500 on one, and 150 on the other, put forth and matterated, as has been invariably the case in all instances of the small-pox within our knowledge. From these two children, thus effected with Small-pox, fresh matter was taken; and the thirteen children before named, who were totally unaffected with the first inoculation with Small-pox, were again inoculated on the 21st day of November; and the other seven children who had the Cow-pox as first mentioned, were also inoculated with fresh matter from the *Clarks;* and the whole remained together in the same house, in the same room, and often in the same beds, without producing the least appearance of the Small-pox, either by uncommon soreness of the arm, headache, the least degree of fever or pustules — and this we certify to the public, having daily visited the Hospital ourselves, and made the most critical observations and inquiries, which are confirmed by the report of the physicians who attended the experiments (hereto annexed)and therefore are confident in affirming, that the Cow-pox is a complete preventive against all the effects of the Small-pox upon the human system."

"THE PHYSICIANS' REPORT.

"With a view of ascertaining the efficacy of the Cow-pox in preventing the Small-pox, and of diffusing through this country the knowledge of such facts as might be established by a course of experiments instituted for the purpose, and thereby removing any prejudices, which might possess the public mind on the subject, the Board of Health of the town of Boston, in the course of the last Summer, came to a determination to invite a number of Physicians to co-operate with them on this important design; and with a liberality becoming enlightened citizens, erected a Hospital on *Noddle's Island,* for carrying it into execution. Accordingly, on the sixteenth of August last, nineteen boys, whose names are subjoined, were inoculated for the Cow-pox at the office, and in presence of the above-mentioned Board, with

fresh, transparent Cow-pox matter, taken from the arms of a number of patients then under this disease. These all received and passed through the disease to the complete satisfaction of every person present, conversant with the disease.

"On the ninth of November, twelve of the above children, together with one other, George Bartlett by name, who had passed through the Cow-Pox two years before, were inoculated for the Small-Pox on *Noddle's Island*, with matter taken from a Small-pox patient in the most infectious stage of that disease. The arms of these lads became inflamed at the incisions, in proportion to the various irritability of their habits, but not to a degree greater than what any other foreign, virulent matter would have produced. The Small-pox matter excited no general indisposition whatever, through the whole progress of the experiments, though the children took no medicines, but were indulged in their usual modes of living and exercise; and were all lodged promiscuously in one room.

"At the same time and place, in order to prove the activity of the Small-pox matter, which had been used, two lads, who had never had either the Small-pox or Cow-pox, were inoculated from the same matter. At the usual time, the arms of these two patients exhibited the true appearance of the Small-pox. A severe eruptive fever ensued, and produced a plenteous crop of Small-pox pustules, amounting by estimation, to more than five hundred in one and two hundred in the other.

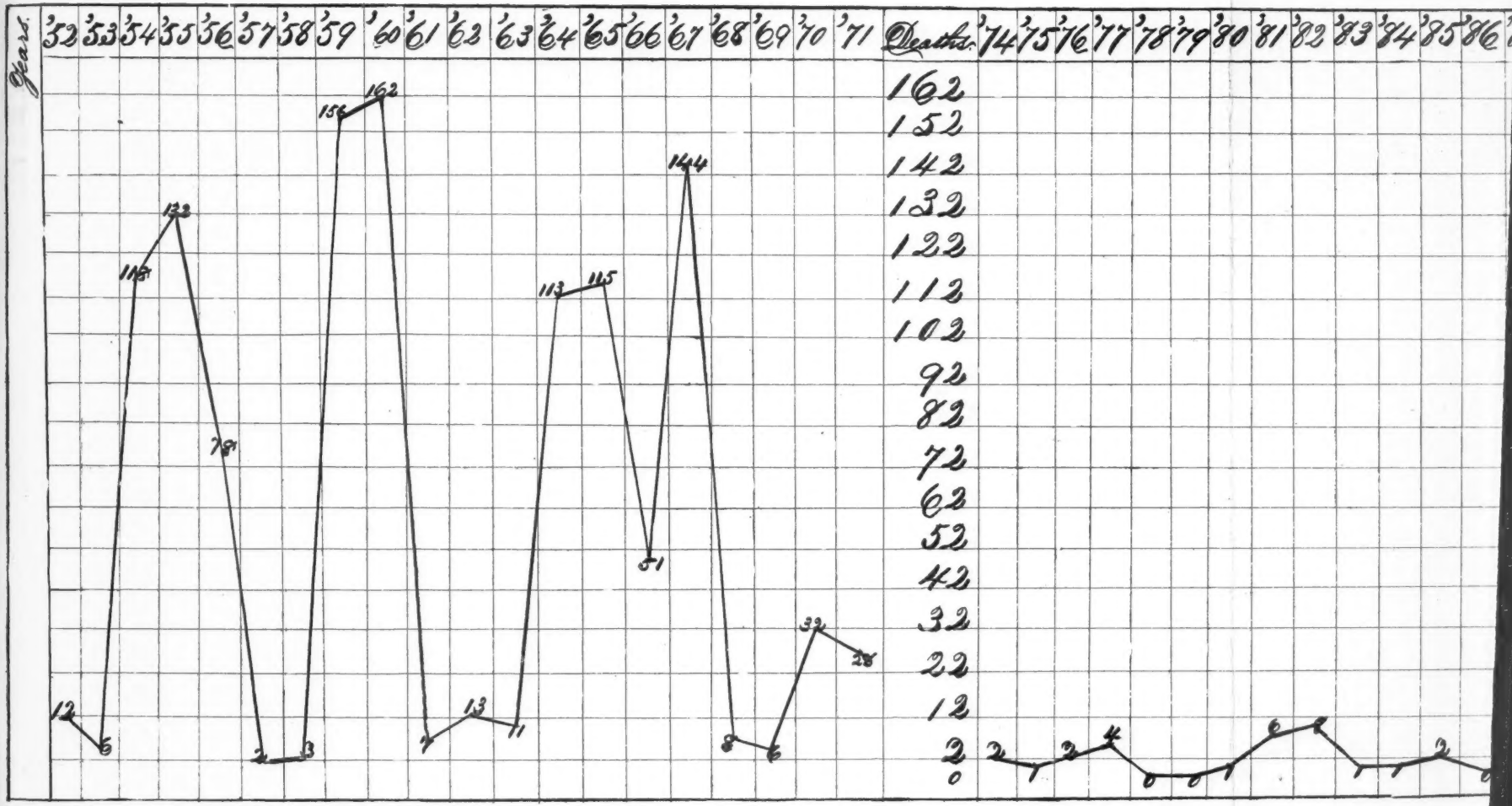
"When these pustules were at the highest state of infection, the thirteen children before mentioned, were inoculated a second time, with recent matter, taken from the pustules, which said matter was likewise inserted into the arms of the seven other children, who were absent at the first inoculation. They were all exposed, most of them for twenty days, to infection, being in the same room with the two boys, who had the Small-pox, so that, if susceptible of this disease, they must inevitably have received it, if not by inoculation, in the natural way.

"Each of the children was examined by the Subscribers, who were individually convinced from the inspection of their arms, their perfect state of health, and exemption from every kind of eruption on their bodies, that the Cow-pox prevented their taking the Small-pox, and they do therefore consider the result of the experiment as satisfactory evidence, that the Cow-pox is a complete security against the Small-pox.

"JAMES LLOYD.
ISAAC RAND.
SAMUEL DANFORTH.
JOHN JEFFRIES.
JOHN WARREN.
THOMAS WELSH.
BENJAMIN WATERHOUSE.
JOSIAH BARTLETT.
JOHN FLEET, jun.
JOHN C. HOWARD.
THOMAS DANFORTH."

Gears.

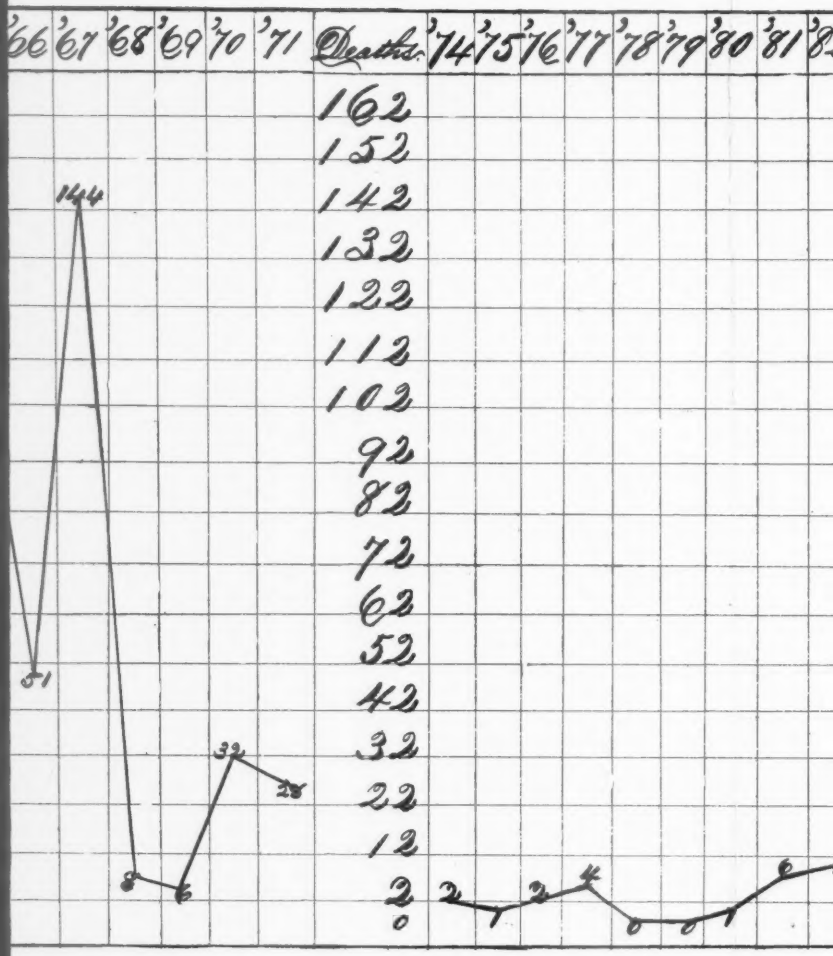
DEATHS FROM SMALLPOX IN BOSTON FOR FORTY YEARS — 1852-1871, AND 1874-1893.



DEATHS, 1,197; POPULATION, 187,969.

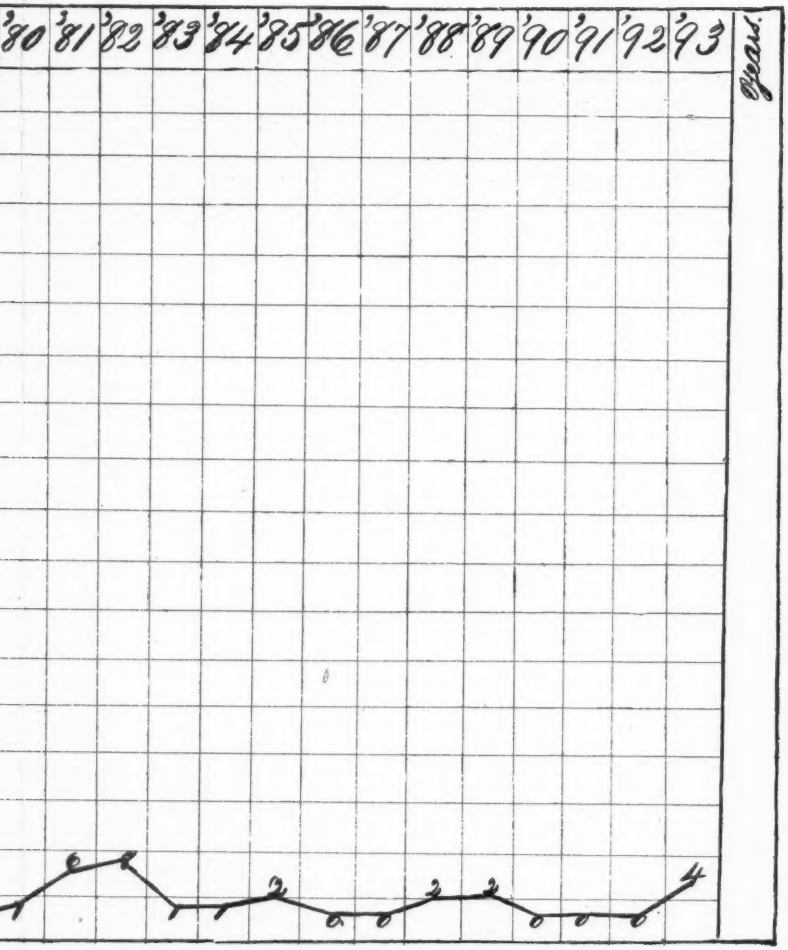
DEATHS, 36; POPULATION, 4

SMALLPOX IN BOSTON FOR FORTY YEARS — 1852-1871, AND



DEAT

-1871, AND 1874-1893.



DEATHS, 36; POPULATION, 402,081.

(Then follows a certificate made by Dr. Bartlett.)

"CHARLESTOWN, Dec. 15, 1802.

"This may certify, that my son, George Bartlett, at the age of eight years, was inoculated for the Cow-pox," (of course, in these days we would say he was vaccinated, but that was the term in use at that time,) "on the eleventh day of November, 1800; that the appearance of his arm, and the symptoms, so fully corresponded with the plates and publications I had then seen, as to convince me, and others of my medical friends, that he had the disease.

"JOSIAH BARTLETT,
"*Fellow of the Mass. Medical Society.*

"To the President and Members of the Board of Health,
"Boston."

"BOSTON, December 8, 1802.

"We, Susanna Truman and Lucy Learned, nurses attending on the experiments corroborating the efficacy of the Cow-pox do certify that there was not the least sickness or appearance of Small-pox among any of the children who were subjects of the same, during their stay at *Noddle's Island*, excepting the two boys, Thomas and John Clarke, who had never had the Cow-pox, and were inoculated for the Small-pox, with a view to render the experiment more complete.

"SUSANNA TRUMAN.
"LUCY LEARNED."

"Health-Office, BOSTON, December 16, 1802.
"Published by order of the Board of Health.

"ISAIAH DOANE, President.

"R. GARDNER, Secretary."

It seems to me that this is an extremely valuable and very interesting document, and I will present it for your inspection.

On this chart you will see the deaths from smallpox in Boston for forty years — from 1852 to 1871, and from 1874 to 1893. The slight epidemic of 1872 and 1873 has been purposely omitted, as this was an exceptional time, and no reliable deductions could be drawn from it. During the twenty years commencing with 1852 and ending with 1871, when the average population was 187,969, there were 1,197 deaths from smallpox in this city. In 1852 there were 12 deaths; in 1853, 6; in 1854, 118; in 1855, 132; in 1856, 78; in 1857, 2; in 1858, 3; in 1859, 156; in 1860, 162; in 1861, 7; in 1862, 13; in 1863, 11; in 1864, 113; in 1865, 115; in 1866, 51; in 1867, 144; in 1868, 8; in

1869, 6; in 1870, 32; in 1871, 28. As I said before, the total is 1,197, with a population of 187,969.

You must also bear in mind that communication with foreign countries was not nearly so rapid as now, and that a person, during the years from 1852 to 1871, if he contracted the disease in Liverpool, would be very sure to be taken ill before the vessel arrived here. During the twenty years from 1874 to 1893, with an average population of 402,000, there were only 36 deaths. The number of deaths each year is as follows: In 1874 there were 2 deaths; in 1875, 1; in 1876, 2; in 1877, 4; in 1878, 0; in 1879, 0; in 1880, 1; in 1881, 6; in 1882, 8; in 1883, 1; in 1884, 1; in 1885, 2; in 1886, 0; in 1887, 0; in 1888, 2; in 1889, 2; in 1890, 0; in 1891, 0; in 1892, 0; in 1893, 4.

I would like to call your attention to this diagram that was taken from the report of a smallpox epidemic in Sheffield, England, from 1887 to 1888. You will see that there are six large squares, and that each of the large squares is divided into ten smaller squares. The squares divided by diagonal lines represent cases; the black squares represent deaths.

It will be seen from this diagram that of 4,493 vaccinated people exposed to smallpox under ten years of age, only 7.8 per cent. had the disease, and only one-tenth of one per cent. died; that of 13,423 vaccinated people of ten years of age and upwards, 28.1 per cent. contracted the disease, and 1.4 per cent. died; that of 18,220 vaccinated people of all ages 23 per cent. had the disease and 1.1 per cent. died. On the other hand, it will be seen that of 263 unvaccinated children under ten years of age exposed to the disease, 86.9 per cent. contracted it, and 38.1 per cent. died; that of 469 unvaccinated people ten years of age and upwards, 68.6 per cent. contracted the disease, and 37.1 per cent died; that of 736 unvaccinated persons of all ages exposed to smallpox 75 per cent. contracted the disease, and 37.2 per cent. died. The difference between a death-rate of one-tenth of one per cent. in vaccinated children under ten years of age, as compared with a death-rate of 38.1 per cent. in unvaccinated children under ten years of age, can only be explained by the protective power of vaccination; and a similar remark is true regarding the difference in death-rate between the vaccinated of ten years of age and upward, as compared with the death-rate of the unvaccinated of ten years and upwards.

In Boston during this present epidemic, or, I should hardly say epidemic, but during this outbreak of the disease, we have had ninety-five cases of smallpox, or, to speak accurately, we have had ninety-six cases, because there has been one case reported since I came to this meeting. There have been twenty-six deaths. No vaccinated person has died. I have seen the arm of every person who has been at the hospital. I have scarched carefully for a scar in every instance, and in no instance where I have seen a scar that was satisfactory to me, or a scar on account of which

Cases, 7

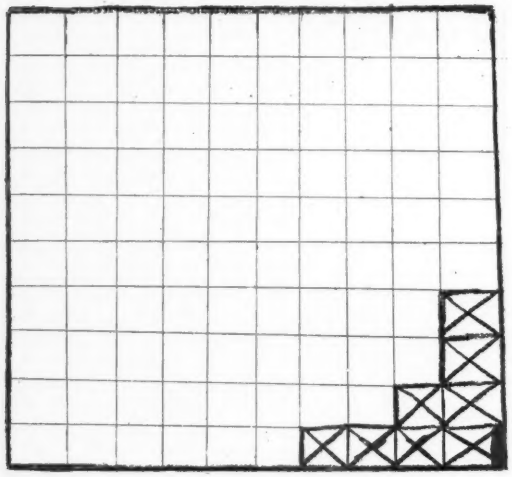
VACCINATED.

Cases,

UNVACCINATED.

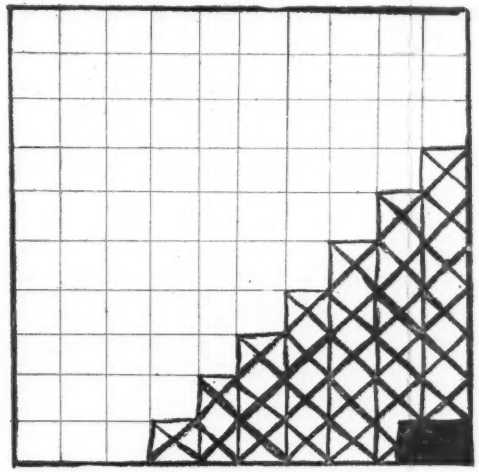
Diagram of the Cases of Smallpox in the Vaccinated and Unvaccinated at Sheffield, England, 1887-1888.

4,493
Cases, 7.8 per cent. Deaths, 0.1 per cent.



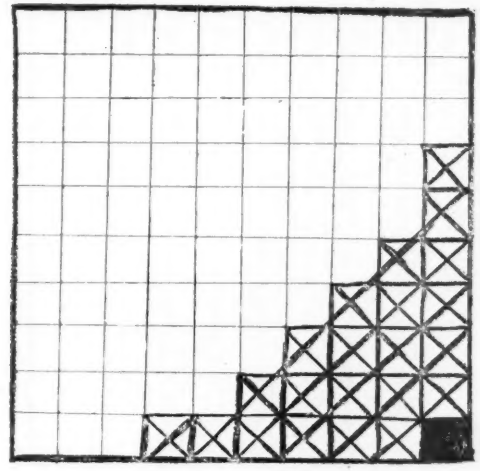
Under 10 years of age.

13,435
Cases, 28.1 per cent. Deaths, 1.4 per cent.



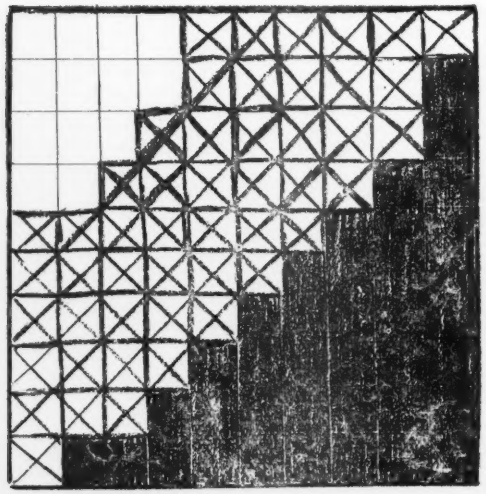
10 years of age and upwards.

18,020
Cases, 23.0 per cent. Deaths, 1.1 per cent.



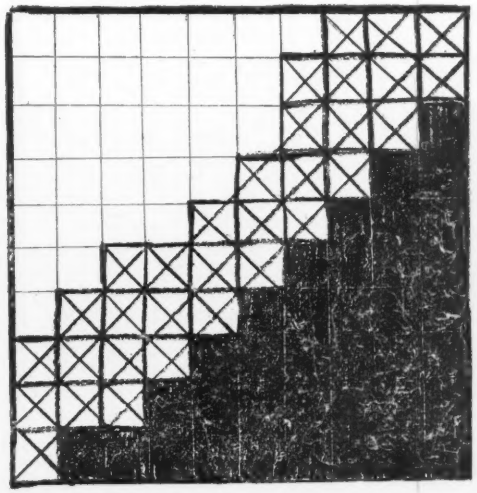
All ages.

263
Cases, 86.9 per cent. Deaths, 38.1 per cent.



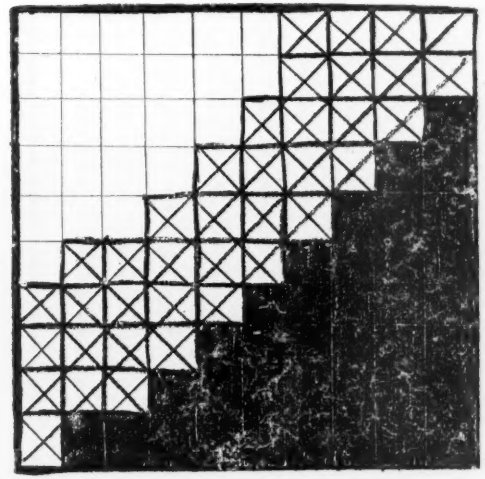
Under 10 years of age.

469
Cases, 68.6 per cent. Deaths, 37.1 per cent.



10 years of age and upwards.

736
Cases, 75.0 per cent. Deaths, 37.2 per cent.



All ages.

I should have given a certificate to allow a child to go to school, has a person been seriously ill.

Much has been said about the possibility of making a diagnosis before the appearance of the eruption. It is absolutely, morally and physically, impossible for anybody to make a diagnosis of smallpox before the eruption appears, and when I speak of the eruption I mean the eruption of smallpox. I do not mean the initial rash. Smallpox in a vaccinated person is very frequently so mild that it is almost impossible to make a diagnosis unless the physician is familiar with the disease. In regard to the isolation of persons who have been exposed to smallpox, it does not seem to me that this is important if other precautions are taken. It has been our custom in Boston, after a case of smallpox has been removed to the hospital, to have the patient's house visited every day or every other day by some physician. The moment that there is any appearance of illness in any member of the family, that person is placed under the most rigid supervision, and as soon as the eruption appears is removed to the hospital.

[At this point Dr. Walcott was obliged to retire from the meeting, and Dr. Durgin was called to the chair.]

The CHAIRMAN. Dr. Chapin, tell us something about smallpox up in Chicopee.

Dr. CHAPIN. Mr. President and Gentlemen: I do not know much about smallpox in Chicopee. I am not from Chicopee. I am from Springfield. Smallpox appeared in Holyoke some few weeks ago and later appeared in the city of Chicopee, about three miles north of Springfield. It appeared in a — there is nobody here from Chicopee, is there, Doctor?

The CHAIRMAN. No, sir; I think not.

Dr. CHAPIN. It appeared in a tenement house belonging to the Dwight Manufacturing Company of Chicopee. I think there were about twenty-eight people in the tenement house. The case that was discovered was some two weeks old. The whole population of the tenement house had been exposed, together with certain other people working in the mill. The Board of Health quarantined the tenement and the people in the building, and the disease has not extended much outside of the building in which it appeared,— I think not more than half a dozen cases. We are very closely connected in Springfield with Chicopee, but fortunately no cases have appeared among us. A few cases have sojourned with us, but those cases left the town the day before the eruption appeared. That is all I know about smallpox in Chicopee.

The CHAIRMAN. Dr. Field, of Lowell.

Dr. FIELD. Mr. Chairman: Dr. McCollom has said that we cannot make a diagnosis of smallpox before the eruption breaks out. The trouble has seemed to be with us in Lowell that we could not make the diagnosis

after the eruption broke out, because some of our oldest physicians there, physicians whom the Board of Health employed, thinking they knew more about smallpox than we did, were unable to tell the disease when they saw it. The first thing I thought of this afternoon when that paper was passed around was, if the physicians of Boston ninety years ago were convinced that vaccination prevented smallpox, we ought to be ninety times as much convinced of it. As they were then, we ought to be cranks on the subject of vaccination just as much as some of these people are cranks on anti-vaccination. We ought always, in season and out of season, to urge vaccination upon the people. If we are members of a board of health, we ought to have our neighborhood and employees vaccinated, and keep them vaccinated all the time. As physicians, when school children come to us in the fall to be vaccinated before they go into school, we ought to advise their parents and older brothers and sisters to be revaccinated. Do not put off vaccination until the epidemic occurs, but keep the inhabitants of the city vaccinated all the time.

In Lowell we had a very severe epidemic of smallpox in 1881, one hundred and eight deaths occurring. Since then in two or three years there have been outbreaks of smallpox, with a few deaths. Last Christmas the present epidemic occurred. On the afternoon of that day we found a young bartender had been laid up for more than a week, and on the next day we found two girls who had been ill four or five weeks, so there were three cases which had been ill this length of time. This young bartender was attended by a physician who was dismissed just as the eruption began to break out. On the next day a young man who had never seen smallpox was called in and treated the case as a case of chicken-pox. The case was so much advanced that when I saw it, the day after Christmas, the pustular stage was already reached. At that time we had established a vaccination office in the barroom in which the young man was employed, but some members suggested that if we use such a very attractive place for a vaccination office the whole city of Lawrence would come up there, and so that idea was abandoned.

Our consulter, whom we called in on that case, for we had not seen more than four or five cases of smallpox, remarked that the first cases were the two girls whom he had seen three or four weeks ago. We found the house and found the two girls convalescing, but covered all over with scars, about two thousand, although they were not counted.

The history of the disease was that of a mild disease, but from these girls we traced it to this man, and afterwards to another person, tracing the contagion from one to the other. It seemed impossible that two girls had been suffering from smallpox for four or five weeks. and that persons had been in and out of the house during that time. Dr. Abbott, who came up

afterwards to see the case, made a diagnosis, not from anything he could see on the patient, because you could see nothing but scars, but from the history of the contagion, spreading from these girls to this man and to others.

So we had three cases of smallpox at the start to which people had been exposed in great numbers. Afterwards we had other cases, nine in all, with three deaths. One case was a bad case, which we traced to this man, and which we sent to the hospital. The eruption came out when the vaccination sore on the patient's arm was at its height.

We had two other interesting cases. One was a milkman, who, when the eruptions were on his forehead, had been delivering milk about the city. Another was a nurse in a smallpox hospital who had had smallpox in her childhood, and we made the mistake of not vaccinating her, and after all the other patients had come down, she finally came down with the disease, and recovered.

Our treatment was to send every patient to the hospital. Following out the suggestion of Dr. McCollom, our hospital too was on the land, and I think almost every city, excepting those on the seaboard, would have to have a hospital on the land. We disinfected the premises as far as possible. I wish that we and all the cities in this State might have an apparatus for the disinfection of clothing by steam, the way they do in Boston. Our clothing we took to the cremator and burned up.

On vaccination I do not want to say anything. That subject comes up later. I simply want to speak of the large portion of the inhabitants of Lowell who were vaccinated. When we found that that milkman had been distributing milk throughout the city, we ordered a house-to-house vaccination in all parts of the city which he visited. About one-sixth of the city must have been vaccinated. In addition to that, some ten thousand were vaccinated at the City Hall and eight thousand at the hospital. 26,500 in all vaccinated out of 87,0000 inhabitants.

We believe in Lowell most thoroughly in quarantining a house, and we have an idea that if the houses had been quarantined in Boston, possibly we might not have had the smallpox in Lowell. We cannot prove that, but we know some of these patients who afterwards came down with smallpox would have gone off, and what town they would have gone to we do not know.

The CHAIRMAN. Mr. Bayles, of Lowell.

Mr. BAYLES. Mr. Chairman: I can only talk of smallpox from the point of view of the layman. I feel like taking some exceptions to Dr. McCollom's view of isolation. The cases of smallpox in Lowell occurred in a very compact community. The two girls who had been sick for five weeks were in a house adjoining the house which was first reported to us. The young

man had been visiting back and forth. He was acquainted with the young women, and his sisters were in the habit of going back and forth; in fact, the space between the two houses was only about five feet. The morning after Christmas, when we found these two girls sick, the question arose as to what we should do. It was a very serious question with us, but we finally decided that the best thing to do was to quarantine both houses, so we put a guard there. We employed policemen, but I should advise any Board of Health of any town not to employ policemen, because they are very expensive luxuries. [Laughter.] We found we had to pay the policemen three days for one. Then we had to keep them pretty well supplied with stimulants, because they had the idea that if they had plenty of rum they would not have the smallpox. [Renewed laughter.] We subsequently employed our own men who had been appointed constables, and the results were more satisfactory. They were better satisfied with what they got, and satisfied with reasonable compensation. We quarantined those two houses.

When the next case broke out it was across the street, distant perhaps about fifty yards from the first two houses. In that case the young women had visited back and forth in the house where the young man had been sick and where the two girls had been sick. We quarantined that house, which was over the barroom in which the young man was employed.

The next case occurred around the corner, distant perhaps about twenty yards from the house in which the first patient was found, that is, the first patient that we were apprised of, and then we put that quarantine there. We had a very compact district, and there was no difficulty whatever in keeping people within bounds. They took to it very kindly. We had to provision them and give them everything they wanted, in fact, a good deal more than they wanted, for some of them were very shrewd, and they discovered that they wanted barrels of flour, and we found subsequently in one place where we had sent a barrel of flour that after quarantine was removed sixteen days later, the barrel of flour was still intact. We had six families in quarantine. The clothing and furniture in the rooms of two of the patients were destroyed. Had we suitable apparatus for disinfecting we would have been spared that expense, but we had no means of disinfecting other than sulphur, although I have not much faith in it. I think the policemen who went anywhere near the place went in and smoked themselves two or three times a day.

We directed a rigid quarantine and a very thorough vaccination, which tended to shorten the outbreak. I do not think that it would have been possible for us in Lowell to permit any of the people living in the house of the patient to go about at their work, because the popular sentiment there is very much opposed to anything of the kind. People have a great dread of

the disease, and as we have so many factories there, everybody knows everybody else, and in a large mill it soon became known that Mary Flynn came from a house where they had smallpox, and we were obliged to establish a quarantine. As it was, we had numerous complaints from officious people who were always watching about for a policeman carrying cans to the people who were quarantined, and we had to shut off their beer. There was a great deal of complaint about that.

In regard to the moving of patients. We had a very antique and ancient vehicle, which in its palmy days had been used as an express wagon. It was impressed into the smallpox business about 1871, then carefully stored away in a shed, and reproduced again in 1893. We used it for an ambulance, and at night we used for a hearse. We learned from that that there was no reason why a person afflicted with smallpox should be treated with any such indignity, and it resulted in our purchasing an ambulance, which we have now, a very respectable vehicle, for conveying our patients to the hospital.

With regard to the hospital. In the old days it was considered anything was good enough for a small-pox patient. A person afflicted with the disease was treated much as a criminal would be,—hustle him out—

> "Rattle him over the stones,
> Only a pauper whom nobody owns."

And so, in 1871 the city of Lowell erected what they called a pest-house. I trust the members of the Board of Health will never use that term. It is a very ominous and very objectionable term. It has great effect on ignorant people, who regard a pest-house as something terrible, something without hope, whereas the term "hospital" has not the terror that the name "pest-house" has. We have been trying up there to get the new set of men, when they make their reports, to drop the term "pest-house." I think it should not be used, just because of the effect it has upon the minds of the people. We found it very difficult to remove people to the pest-house. They did not want to go there because they thought they would not be well treated. Perhaps they were not treated well in the old days when they went to the pest-house. We tried to give them the best treatment we could under the circumstances.

Our hospital is a large barn-like structure having seven rooms. It has no ventilation, no sewerage, no water, no gas, and no heating apparatus—only stoves—and in the winter when the temperature was low and the wind blew, it was a very difficult matter for us to keep all the patients comfortable.

There is no reason why a smallpox patient should be treated any differently than a patient suffering from typhoid fever or any other disease.

Common humanity should teach us to do the best we can for them, and one of the lessons we have learned from this epidemic is that the city of Lowell needs a new hospital, and is going to have one.

I do not know that I can say anything more about the matter. We have simply learned this: that we believe in quarantining all cases, and we believe that when a patient is submitted to our care or when we take charge of a patient, we are in duty bound, not only from a moral sense, but the sense of humanity, from every sense we are bound to give the patient the very best care we possibly can. [Applause.]

The CHAIRMAN. There are still a few minutes more which we can spare upon this subject before taking up the second one on the programme, and if there are other gentlemen who would like to say a few words on the lessons taught by the recent prevalence of smallpox, I should be glad to hear from them.

Dr. SWIFT, of New Bedford. Mr. President: You may be interested in a report of a few cases which we had in New Bedford summer before last, and I will read a short report of these cases.

On June 3, 1892, my attention as city physician was called to suspicious illness in the middle tenement of house numbered 944 South Water street.

The investigation showed a young man, John Andrews, in the pustular stage of smallpox; two children of George Rivers, at the beginning of the stages of desquamation; a young woman, Andrews, who had had a mild case of varioloid in the desquamative stage; and a baby of George Rivers two years old, in the pustular stage of smallpox.

Upstairs in the same house a French family lived; a man named York, with his wife and child, were visiting them. This child was in the pustular stage of smallpox.

The attending physician had considered these cases chicken-pox, and asked me to see them as interesting cases of that disease.

I asked him if he considered them suspicious, and he said he did not. I think the community is exposed to much danger by the ignorance of practitioners in regard to smallpox.

Exactly how physicians are to be trained in the diagnosis of this disease I do not pretend to say; but if there ever is a law passed regulating the practice of medicine in Massachusetts, I trust this Association will insist on at least a thorough theoretical knowledge of smallpox as one of the requirements.

The smallpox hospital had not been open for eleven years; but everything had been kept in readiness for cases, and the patients were all transferred to the hospital on the same day.

On the next day, another suspicious case was reported at 646 South Water street. It was found to be a case of smallpox in the beginning of

the pustular stage, the patient being Charles Andrews, a brother of John Andrews. He was immediately transferred to the smallpox hospital. The other people living in both infected houses were transferred to the old poor-house on French avenue, where a quarantine station was established for persons who, it was thought, had been in any way exposed to the disease.

The cases had been going on for at least two weeks, and it was impossible to say how far the contagion had gone.

On June 8, it was reported that William Andrews, a brother of the men who were already in the hospital, was ill. On investigation, he was found to have a mild case of varioloid. He lived at the east end of Coffin avenue. He was transferred to the hospital, and the other people in the house, to the quarantine station.

On June 9, a case was reported at 305 South Second street.

It proved to be a boy with a light case of varioloid. He was quarantined at home, and another family living upstairs in the house was transferred to the quarantine station.

On June 10, one of the children of the French family named Lemaux, who had lived upstairs at 944 South Water street, came down with smallpox at the quarantine station, and was at once transferred to the smallpox hospital. On June 14, the other Lemaux child also developed smallpox, and was transferred from the quarantine station to the hospital.

On June 15, Joseph Francis was found to be suffering from smallpox at 169 South Second street. He was employed by a grocer, and had taken provisions to the Rivers family. He was at once transferred to the hospital. He was seen at the beginning of the vesicular stage.

The day after he was transferred he had profuse hemorrhages from the nose, mouth, kidneys, and bowels. There were very few pustules, but ecchimotic spots appeared on his extremities, and on the calf of the left leg there was a slough about two inches across. He died the night of June 16, and was buried the next day in the burying-ground near the hospital.

The smallpox hospital, being a small building, was crowded, and it was thought best to construct a cheap building, to be used in case other patients had to be brought to the hospital.

A building was pnt up with eight rooms in it. It was not necessary to transfer any case to this building, but it was used for disinfecting purposes. One of the Rivers children, aged two years, had a severe confluent case of smallpox, and died from exhaustion. It was buried in the burying-ground near the hospital the next day.

On June 18, a case of smallpox was reported at 592 South First street. This was a French boy who worked in a cotton mill, and had no apparent connection with the other cases. He was at once transferred to the hospital. He lived in a large three-story tenement house, and it was impossible to take

all the inmates to the quarantine station. Only the families living on the same floor where the case occurred were transferred. The others were advised to leave the house, and they did so.

After the discovery of this case, it seemed probable that the epidemic might be extensive, and a general vaccination was advised and ordered by the board. This was carried out in all the factories in the city, and in the schools. A house-to-house vaccination was also ordered in the vicinity of the infected houses. There were 14,456 vaccinations made.

The physicians were instructed to vaccinate all persons who had not been vaccinated within five years.

All the tenements where cases of smallpox had been found were thoroughly fumigated and cleaned. All the furniture, carpets, and clothing that had been exposed were destroyed. The tenements were washed with corrosive sublimate solution, and were entirely repainted and papered.

The patients were kept in the hospital until all signs of desquamation had cleared up. Meanwhile they were washed with corrosive sublimate solution and soap. When they were released, they were thoroughly washed with a corrosive sublimate solution and given an entire outfit of new clothing. They were allowed to take nothing away from the hospital.

After being thoroughly disinfected in this way, they were transferred to the quarantine house, and kept there several days before they were allowed to come to the city.

No expense or trouble was spared to do this work thoroughly, and the result was that no new cases developed, either from the infected tenements or from the patients themselves. In my opinion, the importance of the quarantine station in this epidemic cannot be overestimated.

It enables us to vacate the infected houses at once, and not to have them occupied again until they had been thororghly disinfected; it removed the persons living in these houses at once from a possible source of infection in the house, and it gave us the opportunity to watch the persons who had possibly been exposed to infection.

Establishing a quarantine station to which all persons who lived in the houses where cases of smallpox occurred were transferred, had much to do, I believe, with our success in stamping out this epidemic.

We had no power to compel them to go, but told them they must either go or be quarantined at home. If they remained at home they would not be allowed to work, but if they went to the quarantine station we would pay them their ordinary wages. Even on these terms we had much difficulty in persuading them to go.

We consulted our city solicitor in regard to this matter and he told us we had full power to quarantine people who had been exposed to smallpox in their houses, but no law gave us power to compel them to vacate their houses or to transfer them to a quarantine station.

I think the importance of vacating the infected houses cannot be overestimated. In almost all tenement houses certain parts are used in common and people living in infected houses may be exposed to infection in this way. It is almost impossible to properly clean a house with people still living in it. It seems to me power should be given boards of health to vacate houses where cases of smallpox are found and transfer the people who may have been exposed to the disease to a quarantine station for observation.

Two cases of smallpox appearing in the quarantine station showed the wisdom of this precaution. There were thirteen cases in all; one a case of hemorrhagic smallpox, the patient dying before the pustular stage had developed; one case of confluent smallpox in a child of two years, the patient dying of exhaustion; two severe cases of smallpox in John and Charles Andrews; three confluent cases in the two Lemaux children and the York child; all these three children were very ill, but recovered; three cases were mild smallpox,— the two Rivers children and the French boy; and three cases of varioloid.

A point that came up during the epidemic may be instructive to the Association. The law of 1883 requires that when a case of smallpox occurs in a city or town, unless the local Board of Health notify the secretary of the State Board of Health within twenty-four hours of the occurrence of the case, the city or town loses its chance of reimbursment from the State, in case the patient proves to be a State pauper.

The clerk notified the secretary of the State Board of Health on the postal cards supplied to local Boards by the State Board for the weekly report. On this card one space is left for cases of smallpox. The cases were reported at once as one, two, or more, as they occurred.

This notice was not considered sufficient by the secretary of the State Board of Health and he failed to notify the Board of Lunacy and Charity, as he is required to do. Captain Shurtleff, secretary of the Board of Lunacy and Charity, held that he had received no notice and that we had forfeited our chance for any reimbursement. The matter was finally referred to the Attorney-General, and he decided that our notice was sufficient, as all that was required by law was a notice of the occurrence of a case of smallpox within twenty-four hours of the time it was reported to the local Board. Mr. Shurtleff, secretary of Board of Lunacy and Charity, however, held that for their department a special notice was required, as their general rule was to give no aid until after a report in full was made of a case. This view was not in accordance with that of the legal gentleman in the Attorney-General's office, but as the matter of the amount of money to be reimbursed is left by law entirely to the decision of the Board of Lunacy and Charity, we went no further to test the question. It seems to

me that all these laws need thorough revision, and that this Association should take some action in regard to this matter.

Dr. W. G. McDonald, of Boston. Mr. Chairman: I did not intend to say anything on this matter, but since the discussion has started there are two or three points which have come to me. In the first place, in regard to Dr. Field's statement about quarantining in Boston. If Boston had been quarantined better, there would have been less smallpox. I can say this, that after a case was found in Boston, there was no question about keeping the patient in the house. The patient was removed to the hospital. The clothing, bedding, and such things were fumigated. Not only was that done, but the patient was questioned as to where he had been during the last few weeks. The patient's family were questioned, and every trace was followed up as far as possible. Every person who had come in contact with the patient was chased and followed for the next two weeks. It was stated that in Lowell one person knew the other. In large cities each one cannot know the other. Conditions have changed in large cities in the last twenty-five years. We have had a large tide of emigrants and a much different class of emigrants in the last twenty years. We have now one hundred thousand inhabitants more than in 1872, and a different kind of emigrants. At that time the most of the people who came here were from the British Empire or from Germany. They were people who came here to settle and become citizens of this country and become amenable to our laws and follow our habits. They are not so to-day. We have to-day Russian Jews; we have Italians, we have Portuguese and Chinese. We have a different class of people who come here to follow their own customs,— people whom it is very difficult to trace. We have in every instance tried to trace the case to its origin, and we have tried to follow it to its conclusion. In many cases we have failed in tracing it to its origin because of the difference in the people who are here to-day. That was one of the important lessons of this epidemic, different from any other epidemic that we have had.

Besides that, we have the question that has been raised already as to pest-houses. People dread a pest-house. We have, not a pest-house, but a hospital, with the most approved appliances, the most careful nursing and scientific treatment. That should be considered by the people, and the people must be educated in order to appreciate these things. There are cases where people have concealed themselves, and we found them only when the eruption broke out.

We have also the question of the education of physicians. That is a very hard thing, because smallpox is a rare disease, and being rare, a student may go through his course without ever coming in contact with a smallpox case; and if in his course a smallpox case arises, we cannot show it to him — we cannot show it to the entire class. The only education the

students can get is a theoretical one, and that they are as apt to forget as they are the types of any other disease which we do not happen to have in this climate. But we can teach them in varicella. We have had here one such case where they followed an advanced case of varicella, and each student, I think, should be taught in that as well as vaccination.

DR. FIELD. Mr. Chairman, I think the conditions in Lowell are very different from the conditions in Boston. Possibly if Dr. McCollom was in my place in Lowell he would quarantine his smallpox patients there, and probably if I were in his place in Boston, I would not quarantine my smallpox patients here. In Lowell the people largely know each other. I do not mean the patients, I mean the families, Doctor. The families in this locality were all related directly or indirectly through marriage, and they may have been visiting backward and forward, and we felt sure that after we had quarantined the houses we would have no walking cases of smallpox. Under the circumstances, we think it was the part of wisdom to quarantine.

Mr. BAYLES. Mr. Chairman: In Lowell our conditions are very different from those in Boston. Our people work in the factory. In the first instance, where we took that young man, our first case, there were eight persons living in that house. One of those persons was taken sick with the smallpox ten days after we had removed the case. That young woman worked in a factory employing about two thousand people. You can readily see the danger there would be in allowing that family to go to work in the mill among all these people. There were three of the quarantined people working in a factory employing two thousand, two in a mill employing three thousand, and two in a mill employing five hundred. The agents of those mills were extremely solicitous that we should allow no one from the infected houses to come to work, and they absolutely refused to admit them into the mill. They feared that the disease might be brought into the mill, and that they would be subjected to great expense and annoyance in disinfecting their goods before they could ship them to market.

I may also say in respect to the daily examination of the people living in infected houses, that Dr. Field went every day and made an examination of all the people who were quarantined.

Dr. MCCOLLOM. Mr. Chairman: I would like to say that this person could not have communicated the disease until she was taken ill. That was just the point exactly. After having been exposed to smallpox, and after having the clothing thoroughly disinfected, the person could not communicate the disease.

Dr. FIELD. Don't you think she could carry the disease?

QUESTION. Don't you practically quarantine all other diseases, as, for instance, where children go to school where children have had scarlet fever?

Dr. McCollom. We do not have anything to do with that. I think it would be better for the children to be inspected in every case of scarlet fever and diphtheria. I think by inspection, although it will require a great deal of work, much more good will be accomplished for the community, and will stamp out the disease much more thoroughly than by quarantining. If we watch them and disinfect their clothing before they come down with the disease, it is impossible almost for them to communicate the disease.

Mr. Bayles. Sometimes they are too slippery to watch, Doctor.

Dr. ———. Mr. President: It seems to me this method of Dr. McCollom causes a good deal of trouble. Of course, it may be all right as far as the people are concerned, but the rest are put to considerable trouble. I think if the house had been quarantined in the first place, they would not have got to Lowell.

Dr. Swift. May I ask a question? When cases have been coming on in a house for some length of time, is it not a safer method to vacate that house? There are certain parts of tenement houses that are used in common; for instance, the basement usually, and possibly the water-closets; and is it not a safer way to vacate the house, if that is possible, at once, and to have it thoroughly cleaned: remove the people, if they have not already been exposed to the disease, and to permit them to come back when the house has been thoroughly cleaned and thoroughly disinfected, and in case of the patients being sent to the hospital, when the people are perfectly well return to the house? It seems to me that is the most thorough way of proceeding, if it is possible to do it. Of course, I do not mean to say it is always possible. In such a place as New Bedford the houses are small, and it is possible in most cases. The houses, as I have said, in this small outbreak were vacated and the people were not allowed to go back. We did not absolutely control them, but we persuaded them not to go back until everything was perfectly safe for them to go back. Meanwhile we supported them,— bribed them to stay away.

The Chairman. It is getting rather late, and in justice to our next subject I think we shall have to take it up now,—"Vaccination and Its Results." I will call on Dr. Abbott, Secretary of the State Board of Health.

Dr. S. W. Abbott. Mr. Chairman: The transition from smallpox to vaccination is so natural, that I may say a word about smallpox before referring to vaccination. There may be some here who have never seen a case. Here are some photographs taken at the smallpox hospital about ten years ago, which give an excellent idea of its appearance. I will pass them around so that you may see what the typical cases are. There are five or ten pustules to each square inch of body, not quite confluent, but very nearly so. The photographs show the stages from the very first day of the outbreak to the fifteenth day or thereabouts.

Another point is in regard to the time of incubation. Dr. L. Parkes has published a most excellent summary in regard to infectious diseases, in which he gives the least time of incubation at nine days and the longest time fifteen days. Not less, I should say, than fifteen days, would be a pretty good rule for quarantine purposes. Upon this question of vaccination the information to be obtained from the medical journals is slight. In fact, in America, almost throughout the whole country, statistics are entirely wanting on this subject. I have here a tabulation of all the cases that have been reported to us, which probably constitute about all in the State, at least nine-tenths, — from the first of January, 1893, and also a more complete summary for ten years. There have been since that time, that is, in about fifteen or sixteen months, some 188 cases reported to us in the State, all of which, excepting eleven, have been reported within the past seven months. Those eleven were in the early part of 1893. Then there were none for several months until the outbreak began in October, and increased. Then I have a tabulation of cases including the most of those back to 1885. The total number of cases reported to the State Board of Health was 267. There have been enough within the last few days to bring the number up to about 300 or 310. The percentage of deaths is 19 1-2. This is about the average fatality for smallpox. Generally the fatality of it is about 18 to 20 per cent., and that is just where the anti-vaccinationists at the State House always attempt an argument,— that the fatality in this century is no different from what it was in the last century, but they say nothing about the comparative fatality of the vaccinated and the unvaccinated.

I have carried this out as far as possible, and taken the fatality among the vaccinated and unvaccinated in Massachusetts. Of course, there are some cases that have to be thrown out altogether; the facts are unknown or indefinite, based entirely upon some hearsay statement of the patients themselves after the eruption has broken out, and you cannot tell whether they were vaccinated or not. Out of 104 persons who were vaccinated only 6 died, while of 122 persons unvaccinated the deaths were 35, or 28.7 per cent.— nearly five times as high a percentage. The doubtful cases were 41. Deaths among these were 11, a percentage of 26.8, nearly the same as the unvaccinated.

The proof of vaccination statistically is made in several ways. Some methods are more convincing than others. For instance, one proof is that the mortality from smallpox in this century is very much less than it was in the last century. For instance, there were 840 deaths in Boston in 1721, out of 12,000 people, which would mean about 25,000 deaths to-day in the population of Boston, which would be enormous; but it is nothing in this century to what it was in the last; it is nothing now to what it was twenty-five years ago. But that is not sufficient. It is not true that

the State Board of Health, and even local Boards of Health, have accomplished all this. They have accomplished a great deal, but not all.

Another and much better proof is to take a vaccinated community, thoroughly vaccinated, and compare it with a partially vaccinated community. We have the fact that whereas Germany has forty or fifty millions of inhabitants, surrounded by other countries partially vaccinated, Germany has its law (which is not only a law, but it is an enforced and absolute law, for it is an imperial government), that a child shall be vaccinated practically before it is eighteen months old. Then every scholar must be revaccinated at the age of twelve years. Now about the only unvaccinated persons in that country are persons who have come there from Russia, where the law is very lax, or from Italy, or from France, or from Spain, or some other neighboring country; and when any of these die in Germany, of smallpox, of course the death is credited to their death-rate.

Now, the death-rate of Germany for the year 1891 from smallpox was almost nothing when compared with that of these neighboring countries.

Then another very convincing argument is the fact that in the last century smallpox was almost absolutely a disease of children,—a disease of children under ten years of age. The figures upon that subject are not very many or very great, but they relate to a few cities where old registers have been kept very carefully by the schoolmasters, town clerks and others in England, and also in the city of Geneva, Switzerland, and a few other places, where they show that smallpox was confined almost exclusively to children under ten years of age. For instance, out of a thousand persons in two or three English towns who died of smallpox, there were not more than ten or a dozen over ten years of age. We do not have that now. A very considerable percentage of the deaths from smallpox are among people who are over fifteen or twenty, simply because they have been protected by primary vaccination, and the disease is thrown forward to later ages; and as they have neglected revaccination, then we have mortality among the vaccinated, and that is where this adult mortality comes from. There are deaths among the vaccinated because they have neglected revaccination.

Now a word about those who claim to have been revaccinated, and yet have had the smallpox. If those persons had been examined carefully, we should have found that they had not been revaccinated, or that the vaccination was of a very limited character. Every person in Germany who is vaccinated is vaccinated three times on each arm, and it is very thoroughly done. I do not know that that is the law, but that is the custom, and I think in London also.

There is another point in regard to the London statistics which is shown in the law upon that subject. Every child who is vaccinated, at any rate

every one who is vaccinated at the public expense, must by-law, under a penalty, be brought back to the public vaccinator at the end of one week to be examined. That is a very useful law indeed, because a great many physicians might otherwise vaccinate children and let them go without further inspection. It is a very lax mode of procedure to allow the child to pass out of your sight without seeing it again at the end of a week.

Then in regard to methods of selling vaccine lymph. In many cases we know nothing about the mode of obtaining it. That may come up hereafter. I won't speak of that now, but there is one thing which affects this question, — the age and freshness of lymph. Dr. Corey's vaccinations in London are made with fresh lymph. The calf is vaccinated at his station, and the children are brought there when the lymph is to be taken fresh, and the fresh lymph is inserted into the child's arm.

I think that would be a very good addition to our law, but perhaps it could not be enforced except where children were vaccinated at the public expense.

The CHAIRMAN. I would like to ask Dr. Abbott if he can give us some brief data as to the difference in protection between one and many scars.

Dr. ABBOTT. Well, upon that point the principal authority is Dr. Marson, of England, who has made that one point a specialty, having examined a great many cases. It is true that a thorough vaccination is more protective than a limited one. Dr. Marson gives the ratio. I cannot state what the ratio exactly is. It is a diminished one, according to the number of scars. That is, the number of persons who took smallpox with one vaccination mark was greater relatively than those who had two, three or four, or five, or six, as the case might be. It is a fact that old lymph, that is, three, four, or five weeks old, might not produce so large scar, when it produces any at all, as that which is fresh from the calf. I have noticed that myself: that sometimes lymph that is just losing its efficiency will give you a little vesicle perhaps no larger than a small pea or the head of a pin. Perhaps you may have noticed that, Dr. McCollom.

Dr. MCCOLLOM. Yes, I have noticed it, although I never use lymph that is more than two, or three, or four days old.

Dr. ABBOTT. If we could do away entirely with the selling of vaccine lymph, and have it issued directly from a station, as it is in many foreign countries, directly to the physician who uses it, coming from a source that he knows he can rely upon as to the date it is taken from the animal, and not simply the date that it is sold to him,—as I have known here in Boston,— then we should have something that would be of value to us.

Dr. GAGE, of Lowell. I have been asked to say a word or two upon the technique of vaccination, and I will speak of these points: First, what we do when we vaccinate, and how we do it, and the responsibility of boards of health in seeing it done right.

I am not going to give an argument. I am simply going to state my belief and leave to you the discussion of it.

What do we do when we vaccinate? I suppose we introduce into the body a living organism. Possibly the living organism is the cause of smallpox. That is what we do theoretically. Practically we have introduced something besides this bug into the body, a germ which causes the formation of pus in the body.

How do we do it? I will tell you now how I do it. The arm of the patient is first made clean with scrubbing with soap, and water, and brush. By "clean" I mean sterilized. Then a fresh point is scratched upon the arm; and third, the arm is kept clean by putting on a sterile dressing, which is sealed on, and remains until the vaccination has taken.

Now, as I say, sometimes we do more than this. We introduce besides this living germ which causes pus,—and I want to state as my belief here that the germ, if it be that, or what we introduce for vaccination, does not cause a formation of pus.

I do not believe that is produced by the germ introduced for vaccination. I believe that is caused by filth, and that we are reprehensible for those results.

Now I want to speak of another matter in which boards of health are interested, and it is based upon my observations. I am going to speak right out in meeting. There is a law which compels corporations to vaccinate their employees, and when a board of health notifies a corporation that they must do it, they are obliged to do it. That is, it is done by the order of the board of health directly, not as a matter of law. Now, the corporations at home vaccinate in this way: They make a contract with some doctor to come there and vaccinate the employees, and I happen to know as a matter of fact that a large number of corporations at home made a contract this year to have their employees vaccinated in their mills at four cents a head. In order to make anything out of that, the doctor must vaccinate a given number of people in a given time, and he has vaccinated from sixty to eighty people an hour, and one woman claimed she vaccinated one hundred and twenty. That means two persons vaccinated in a minute. I think such methods are reprehensible. The boards of health are established for the promotion of the health of the community, and they should see that their orders are carried out properly. I believe that they should insist upon these three points,—a clean arm, a clean operation and clean dressing. I believe it is incumbent on boards of health, when they issue these orders to the agents of corporations, to see that this is done in accordance with sound principles. That is all I have to say on this subject.

I would like to say a word about vaccination as a preventive of smallpox. Dr. McCollom spoke of the isolation of the patient in a smallpox

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hospital. I think, if I could have only one of the two, either isolation or vaccination, I would give up isolation and take vaccination. I believe vaccination is always cheaper than an epidemic.

I do not agree with Dr. McColiom. I think the time will come when it will be a reproach to any city to have any epidemic, and I believe that time will come when we establish a quarantine.

Dr. ABBOTT. I would like to say one word in reference to the supposed insusceptibility of certain children. I do not believe it exists. Dr. Corey has vaccinated fifty thousand children in succession, without a single break. Some of those had to be revaccinated in order to make it take, to be sure, but they all took. (See Dr. Corey's testimony in Report of British Parliamentary Commission of 1889.)

The CHAIRMAN. It seems to me that this subject is not exhausted so long as there is anything to be said concerning the repetition of vaccination, its thoroughness and the susceptibility found in different individuals. We have those here who have done a great deal of this work. I would state, as a matter of fact, we have seen one case here in Boston where vaccination had never been successful, and that person was a nurse in the smallpox hospital for nearly twenty years, and never contracted the disease. That would represent one of the extremes, and I presume there are other extremes where we might find that a person would show a susceptibility to vaccination about as often as it was applied. Has Dr. McCollom any data that he would like to give us on that point?

The CHAIRMAN. The case to which I referred, Doctor, was not a man; it happened to be a woman, in the person of Mrs. Powers.

Dr. MCCOLLOM. I do not know that I saw Mrs. Powers all the time she was there.

The CHAIRMAN. I think in her case vaccination had never succeeded, and she had never taken smallpox, although she was a very old nurse in the hospital.

Dr. DAVENPORT. Mr. Chairman: During the epidemic of 1871, when I was vaccinating for the city, one case I vaccinated where there was a scar of smallpox, and the vaccination took. As far as I could see, it was a typical take.

Dr. MCCOLLOM. We have had half a dozen cases of a second attack of smallpox. In one case a man had a third attack of smallpox and died.

Dr. DAVENPORT. And there was an infant less than one year of age who died of a second attack.

Dr. C. C. ABBOTT, of Andover. I will report one case where we had a patient who had had smallpox, and showed the characteristic pitting on the face markedly, and as all the inmates of the house were vaccinated. I vaccinated him, making two marks on the arm, and he had two typical, well-

marked vesicles. They came out, the scabs came off, and no ulceration followed, but the typical scar is very marked in his case. He had smallpox two or three years ago in some foreign country, and came here as a sailor. He said they let him go on account of the scars on his face.

The CHAIRMAN. Is there anything further to be said on this subject? If not, a motion to adjourn will be in order.

Adjourned.

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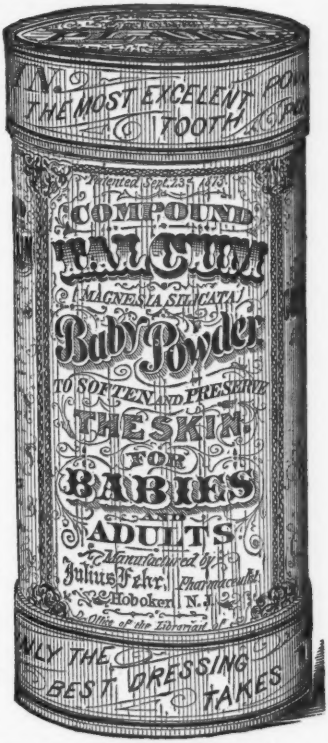

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